

San Francisco Bay Conservation and Development Commission

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September 1, 2017

TO: Commissioners and Alternates

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SUBJECT: **Staff Recommendation for the California Department of Fish and Wildlife's and Solano County Resources Management Department's Hill Slough Wildlife Area Tidal Restoration Project, BCDC Permit No. 2017.003.00md**
(For Commission consideration on September 7, 2017)

Recommendation Summary

The staff recommends approval of BCDC Permit No. 2017.003.00md, to the California Department of Fish and Wildlife and the Solano County Resources Management Department for the Hill Slough Wildlife Area Tidal Restoration Project which, as conditioned, will authorize the following activities:

1. Restore 640 acres of tidal wetlands;
2. Enhance 192 acres of managed wetlands;
3. Improve Grizzly Island Road by raising and widening the roadway; and
4. Enhance and create public trails and bicycle lanes at Hill Slough Wildlife Area in Suisun Marsh.

Staff Recommendation

The staff recommends that the Commission adopt the following resolution:

I. Authorization

- A. **California Department of Fish and Wildlife:** Subject to the conditions stated below, the co-permittees, the California Department of Fish and Wildlife (CDFW) are authorized to conduct the following activities in the Hill Slough Wildlife Area and Grizzly Island Road, in the San Francisco Bay Conservation and Development Commission's (Commission) Primary Management Area of Suisun Marsh, Solano County as follows:

In the Suisun Marsh Primary Management Area:**Phase 1: Site Preparation**

1. Establish a temporary 300-foot by 175-foot, fenced construction staging area in the northern section of Pond 1, along the western side of Grizzly Island Road;
2. Establish a temporary 200-foot by 220-foot (approximate) contractor staging area in the existing maintenance parking area in Pond 4A;
3. Breach or lower approximately 5,000 feet of five existing interior levees to 6.35 feet NAVD88 and use the excavated soil as fill for the road and transitional ecotone habitat construction within the project site;
4. In Pond 1, lower and contour a 10.3-acre area to 4 feet NAVD88 to create improved wetland habitat and place excavated soils to the maximum elevation of 10 feet NAVD88 with 10:1 slope along the interior side of the Whispering Bay levee to strengthen it and provide transitional habitat;
5. Place excavated soils to create transitional habitat along edges of internal breaches;
6. Construct a temporary one-mile long, two-lane road along the western side of Grizzly Island Road using approximately 2,122 cy of imported aggregate, 2,200 cy of recycled on-site road material. Once constructed, shift traffic to temporary road;
7. Raise and widen Grizzly Island Road to elevation 10 NAVD88 and 38 feet wide, with side slopes ranging from 10:1 on the west side and from 3:1 to 6:1 on the road's east side. Add 1.5 feet of surcharge soils, using approximately 31,510 cy of excavated on-site soils, 23,601 cy of imported soils and 3,971 cy of aggregate;
8. In Pond 2, construct an approximately 750-foot long by 20-foot wide utility maintenance access road to elevation 8 feet NAVD88 between Grizzly Island Road and the two PG&E transmission towers to the west of the road; a 500-foot long by 20-foot wide earthen berm to elevation 7 feet NAVD88, extending from the maintenance access road westward; and an earthen buttress berm to 8 feet NAVD88 surrounding the footings of the third westernmost tower at the Suisun Slough levee;

Phase 2: Road Completion and Site Restoration

9. Remove surcharge soils from Grizzly Island Road and temporary roadway, and reuse soil in the road's side slope construction;
10. Surface Grizzly Island Road with approximately 3,503 cy of asphalt and concrete to create two 12-foot wide, opposing traffic lanes, two 4-foot wide Class II bicycle lanes, stripe the road way, and install two 3-foot wide gravel shoulders;
11. Install approximately 287.5 linear feet of guardrail along the outside curve at the southern end of the improved section of Grizzly Island Road;

12. Remove 13 culverts, replace one culvert in-kind, replace four culverts with flap gates (two between Ponds 4 and 5; one between Pond 4 and 4A; and one between McCoy Creek and Pond 4); and cap and abandon one culvert in place;
13. Excavate approximately 60,000 square foot “pothole” to 2.4 feet NAVD88, and a 2,000 foot long swale to elevation 2.3 to 2.5 feet NAVD88 in Pond 4;
14. Grade existing ditches in Ponds 2, 3, and 4 to reduce mosquito breeding habitat;
15. In Ponds 4 and 4A, construct a 10-foot wide, 0.54-mile-long trail to elevation 7 feet NAVD88, parallel to Grizzly Island Road, including a .23-mile segment connecting to the Pond 4 loop trail and a .31-mile segment to the at-grade pedestrian crossing on Grizzly Island Road;
16. Re-using approximately 31,000 cy of on-site soil to raise the existing Pond 4 interior south levee to elevation 9.3 feet NAVD88, to construct a 10-foot wide, 1.76-mile long loop trail around Pond 4, and surface it with compacted aggregate base rock;
17. Place two new interpretive signs, at least one waste container, and a bench along the new public access connecting and loop trails in the eastern side of the site; and
18. Create 640 acres of tidal wetland habitat by breaching or lowering to 6.35 feet NAVD88 the site’s exterior levees at eight locations along Suisun Slough, Hill Slough, and McCoy Creek exposing Ponds 1, 2, 3, 5, 6 and 7 to tidal action.

B. Solano County Resources Management Department: Subject to the conditions stated below, the Solano County Resources Management Department (Solano County) is authorized to conduct road and bicycle lane maintenance of the improved one-mile stretch of Grizzly Island Road in the Commission’s Primary Management Area of Suisun Marsh, Solano County as follows:

1. Conduct routine maintenance, repair and management of the roadway, bicycle lanes, shoulders and side slope, including surface and shoulder repair, striping, signage, safety barriers for automobile and bicycle traffic, vegetation management, and debris removal along edges of road with disposal of debris outside the Commission’s jurisdiction; and
2. Install and use temporary pumping equipment during flood events and road inundation.

C. In-Kind Repairs and Maintenance. CDFW and Solano County’s repair and maintenance work shall be confined to existing structural footprints, shall consist of in-kind repairs and replacement only, and shall not result in the enlargement of the existing levees, trails or roadway. Any in-kind repairs and maintenance of all areas shall only use construction material that is approved for use in San Francisco Bay. Construction shall

only occur during current approved months during the year to avoid potential impacts to fish and wildlife. Commission staff should be contacted to confirm current restrictions.

- D. **Basis of Permit.** This authority is generally pursuant to and limited by your application dated February 1, 2017, including all accompanying and subsequently submitted correspondence and exhibits, subject to the modifications required by conditions hereto.
- E. **Deadlines for Commencing and Completing Authorized Work.** Activities authorized in this permit must commence prior to September 1, 2018, or this permit will lapse and become null and void. All work authorized must be diligently pursued to completion and must be completed within four years of commencement or by December 1, 2022, whichever is earlier, unless an extension of time is granted by amendment of the permit.
- F. **Project Summary.** The proposed project will result in the restoration and transition of 640 acres of managed wetlands into tidal marsh, including 53 acres of transitional habitat: and 192 acres of enhanced managed seasonal wetlands and upland habitat. Restoration of the managed wetlands to tidal marsh will include: site contouring, levee lowering and the construction of sloped transition habitat berms throughout the site, resulting in mid to high marsh habitat. The enhancement of managed wetlands will include: site contouring and the construction of swales, a “pothole” (seasonal pond). Additional necessary construction activities include construction of protective berms around transmission towers, a maintenance access road on a berm between two towers, and an extension of the access berm into the tidal marsh to prevent boaters from entering an area with low hanging transmission wires.

The project will also result in the improvement of a one-mile section of Grizzly Island Road that bisects the wildlife area, raising the road’s elevation to 10 feet NAVD88, widening the traffic lanes, adding two bicycle lanes, and gravel shoulders. Two temporary traffic lanes will be constructed adjacent to the road for use during the two-year road improvement activities.

The public access provided with the project includes the construction of nearly 2 miles of new trails, new interpretive signs, seating along the loop trail, and two new bicycle lanes on Grizzly Island Road.

In total, the project will result in the excavation of approximately 126,000 cy of soils and site features over an 80-acre area and the placement of approximately 138,000 cy of fill, the majority of it being the excavated soil from the site. The excavated soils will be used to build the temporary road, raise Grizzly Island road, build the habitat and access berms, and the public trails. Following site and road construction, sections of the existing exterior levees will be breached in eight locations, opening the site to Suisun Slough, Hill Slough and McCoy Creek, restoring daily tidal action to the site.

II. Special Conditions

The authorization made herein shall be subject to the following special conditions, in addition to the standard conditions in Part IV:

A. Specific Plans and Plan Review

1. **Construction Document(s).** The improvements authorized herein shall be built generally in conformance with the following documents:
 - a. *Project Plans for the Construction of Grizzly Island Road* prepared by Quincy Engineering, dated March 1, 2017; and
 - b. *Hill Slough Tidal Restoration* prepared by Ducks Unlimited, dated March 2, 2017.

The permittee(s) is responsible for assuring that all construction documents accurately and fully reflect the terms and conditions of these plans and any legal instruments submitted pursuant to this authorization. No substantial changes shall be made to these plans without prior review and written approval by or on behalf of the Commission through plan review or a permit amendment.
2. **Construction Schedule.** Permittee shall provide a schedule indicating when excavation, fill and/or grading, and road construction will occur and the time allocated for the road surcharging and habitat feature stabilization before the road raising is completed, levees are breached and the site is exposed to tidal flows and the paths and bike lanes open to the public.
3. **Preliminary and Final Plan Review for Bench, Signage and Waste Containers.** No work on the public access bench, waste container(s) and the interpretive signs authorized herein shall commence until final designs and plans have been submitted, reviewed, and approved in writing by or on behalf of the Commission. Specific drawings and information required in such plans shall be discussed and determined in coordination with Commission staff prior to submittal. To save time, preliminary drawings should be submitted and reviewed prior to submittal of final drawings.
4. **Plan Approval.** Plan approval or disapproval shall be based upon: (a) completeness and accuracy of the plans in showing features authorized herein; (b) consistency of the plans with the terms and conditions of this authorization; (c) the preparation of the plans by professionals and their official stamp or certification of approval; (d) assurance that appropriate provisions have been incorporated for safety in case of a seismic or flooding event; (e) assurance that all public access improvements authorized or required herein are reflected; (f) assuring that appropriate designs and materials have been used to render the public access resilient to overtopping, flooding, and 100-year storm events; and (g) assuring that existing public access will not be impeded during construction to the maximum extent feasible.

5. **Discrepancies between Approved Plans and Special Conditions.** In case of any discrepancy between final approved plans and special conditions of this authorization, the special condition shall prevail. The permittees are responsible for assuring that all plans accurately and fully reflect the special conditions of this authorization.
- B. **Public Access.** The CDFW (trails) and Solano County (bicycle lanes) shall provide and maintain the authorized public access improvements as a condition of this permit as described herein.
1. **Total Area.** The public access provided by this project shall total approximately 21,500 linear feet, totaling 3.45 acres, consisting of, but not limited to, two trails, two bicycle lanes on Grizzly Island Road (maintained by Solano County), one bench, interpretive and wayfinding signage. Prior to installation, the public access features shall be subject to final plan review approval pursuant to Special Condition II-A of this permit.
 2. **Areas and Improvements.** CDFW shall construct and make available to the public for public access uses, including walking, running, biking, sitting, viewing, picnicking and related purposes, the following public access areas and improvements, as generally shown on Exhibit B:
 - a. Atop the improved Pond 4 levee, an all season, 1.76-mile, 10-foot wide aggregate base loop trail;
 - b. Parallel to Grizzly Island Road (in Pond 4A), a 0.31-mile long, 10-foot wide aggregate base trail;
 - c. A connection of the Pond 4A trail to Grizzly Island Regional Trail system via an at-grade pedestrian crossing on Grizzly Island Road;
 - d. Two dedicated, 4-foot wide Class II bicycle lanes along the one-mile section of improved Grizzly Island Road, including striping and signage, to be made available and maintained by Solano County;
 - e. Placement of one bench along loop trail for viewing and resting;
 - f. Interpretive and wayfinding signage, currently proposed at the public access trail's at-grade pedestrian crossing of Grizzly Island Road, focusing mainly on the views of the eastern side of the project site, and a description and map of the loop trail; and
 - g. Placement of a minimum of one waste container in the vicinity of the public access trails.
 3. **Bike Lane Monitoring.** In the first year after the road is opened for use, Solano County shall monitor the Class II bike lanes use for safety and vehicular encroachment. Within six months of completion of monitoring, Solano County shall provide their findings and an analysis of any needed improvements to Commission staff for consideration. If Solano County determines that the current bike lane

configuration is blocked by motor vehicles or is otherwise unsafe, then remedial measures shall be undertaken to improve safety and reduce the encroachment of motor vehicles in the bicycle lanes.

4. **Public Access During Construction.** During construction, impacts to existing public access areas shall be minimized. All work areas shall be appropriately screened and fenced and any on-land construction equipment shall be operated in a manner to ensure that impacts to public access areas are minimized. CDFW shall place appropriate signage on either side of construction areas, as needed, to alert the public of the work, advising caution and potential delays, indicating when public access areas may be closed, cleared, and re-opened, and indicating the location of alternative routes around the construction. The CDFW shall provide alternative routes around construction zones and ensure that appropriate signage and personnel are on-site to re-route the public around any portion of the public access areas that may be closed during construction activities.
5. **Maintenance.** The areas and improvements within the (3.45 acres) public access area described above shall be permanently maintained by and at the expense of the co-permittees or their assignees. The CDFW is required to maintain the public access trails and amenities, and Solano County is responsible for maintain the bicycle lanes, road and shoulders.

Such maintenance shall include, but is not limited to: repairs to all path surfaces; repairs or replacement as needed of any public access amenities such as signs and benches; periodic cleanup of litter and other materials deposited within the access areas; vegetation trimming and removal of any encroachments into the access areas; assurance that the public access signs remain in place and visible; and repairs to any public access areas or improvements that are damaged by future subsidence or uneven settlement, or flooding. Should sea level rise cause inundation and the inability for the public access features to be accessible, CDFW will assess the redesigning of public access features to protect and ensure the usability of the public access areas and improvements. The assessment would include raising the trails in place, in-kind trails in alternate locations or out-of-kind public access features on- or off-site.

Within 30 days of notification by Commission staff, the permittees shall correct any maintenance deficiency noted, to the extent feasible. The permittees shall obtain approval by or on behalf of the Commission of any activities that result in more than in-kind repair and replacement.

6. **Reasonable Rules and Restrictions.** The permittees may impose reasonable rules and restrictions for the use of the public access areas to correct particular problems that may arise. Rules may include restricting hours of use and delineating appropriate behavior. Prior to implementing such limitations, rules, and restrictions the permittees shall provide a description and substantiation of the specific problem being addressed, and the proposed limitations, rules and restrictions to the

Commission staff for review and approval by or on behalf of the Commission. The Commission staff shall review the proposal to determine whether or not the proposal will significantly affect the public nature of the area, unduly interfere with reasonable public use of the public access areas, and would tend to correct the identified problem.

7. **Assignment.** The permittees shall transfer maintenance responsibility to a public agency or another party acceptable to the Commission at such time as the property transfers to a new party in interest but only provided that the transferee agrees in writing, acceptable to counsel for the Commission, to be bound by all terms and conditions of this permit.

C. Site Construction and Minimization Measures.

1. **Construction Operations and Staging.** Staging areas for demolition and construction shall be located within the designated areas shown on the plan titled, *"Project Plans for the Construction of Grizzly Island Road,"* prepared by Quincy Engineering, dated March 1, 2017 and *"Hill Slough Tidal Restoration"* project plans prepared by Ducks Unlimited, dated March 2, 2017. The permittees shall use all excavated soils to construct sloped transitional habitat berms, utility access berms, side-slopes of the improved Grizzly Island Road, and to shape the other project features including stabilizing and raising the existing levees, swales, and "pothole" as appropriate per engineering requirements. Excavated soil may be temporarily stockpiled within the construction area, per the construction plans provided that when not in active construction, the soil piles are covered with appropriate material to assure that they do not blow, wash or erode into the surrounding marsh, or waterways.
2. **Storm Water Pollution Prevention Plan.** Prior to and during construction, CDFW shall implement the Storm Water Pollution Prevention Plan (SWPPP) dated April 3, 2017 to prevent the transport of sediments and/or construction contaminants from the staging areas into the surrounding areas. CDFW shall employ erosion control measures and best management practices regarding storage of fuels and equipment maintenance, and shall include preparation for control and cleanup of potential spills.
3. **Vegetation Protection.** Prior to commencing construction, CDFW shall perform pre-construction surveys for special status plant species, and if found, shall transfer identified species into appropriate holding facilities, until such time that they can be replanted at appropriate locations within the project site. Further, common marsh vegetation shall be salvaged as feasible during construction and used to revegetate disturbed areas once construction is complete. The work authorized by this permit shall be performed in a manner that will minimized driving in marsh areas, prevent, avoid, or minimize to the extent possible any significant adverse impact on any existing native vegetation outside of the construction zone.

4. **Breaching Exterior Levees.** The lowering or breaching of the exterior levees shall be conducted at low tide to prevent sediments from entering the adjacent sloughs and to minimize any turbidity resulting from the activity as well as impacts to listed species;
 5. **Debris Management and Removal.** All construction operations shall be performed to prevent construction materials from falling, washing or blowing into the Bay or drifting and becoming a navigation or pollution hazard. In the event that such material escapes or is placed in an area subject to tidal action of the Bay, the permittees shall immediately retrieve and remove such material at its expense. All construction debris shall be removed to an authorized location outside the Commission's jurisdiction. In the event that any such material is placed in any area within the Commission's jurisdiction, the permittees, its assignee, or successor in interest, or the owners of the improvements, shall remove such material, at their expense, within ten days after it has been notified by the Executive Director of such placement.
- D. **Protection of Special-Status Fish and Wildlife.** The co-permittees shall take all precautions to avoid adverse impacts to special-status species such as the Delta smelt, Ridgway's rail, salt marsh harvest mouse, and the California least tern and their associated habitats. The co-permittees shall implement the best management practices contained in the *Suisun Marsh Habitat Management, Preservation and Restoration Plan* (Suisun Marsh Habitat Restoration Plan), conservation measures included in the programmatic Biological Opinion for the Suisun Marsh Habitat Management, Preservation and Restoration Plan (2013) and the project specific measures described in the U.S. Fish and Wildlife Service's (USFWS) Biological Opinion for Hill Slough Tidal Restoration Project (June 23, 2017) to ensure that impacts to special-status species are minimized. Such measures include:
- A pre-construction survey shall be conducted for Ridgeway's rail and least tern by a USFWS approved biologist. For Ridgeway's rail the survey shall follow the USFWS' 2015 *California Clapper Rail Survey Protocol*.
1. **Delta Smelt.** To minimize the effects on delta smelt, all in-water activities such as levee lowering and breaching shall occur during the Suisun Marsh Delta smelt in-water work window between September 1st and November 30th of any year. Further, when feasible, in-water work shall occur during periods when water temperature is greater than 15 degrees Celsius when adult delta smelt are less likely to be present in shallow water habitat.
 2. **Ridgeway's Rail.** If pre-construction surveys of the site conclude that Ridgeway's rail is not present, construction can occur during species breeding season (February 1st through August 31st). However, if Ridgeway's rail are present in the immediate construction area, the following measures shall be applied:
 - a. No activities will occur within 200 to 700 feet of rail calling center (described in the protocol), during breeding season, depending on site characteristics;

- b. No activity shall occur within two hours before or after an extreme high tide (6.5 feet or greater) in or adjacent to Ridgeway rail habitat; and
 - c. Prior to conducting post-breach monitoring and management activities CDFW shall conduct a protocol level survey during breeding season in areas within or adjacent to breeding habitat.
3. **Salt Marsh Harvest Mouse.** Prior to construction and immediately following a high tide, a temporary exclusion fence shall be installed 1 to 20 feet outside the work boundaries and adjacent to marsh habitat to prevent the salt marsh harvest mouse from entering the construction zone. Under the supervision of the USFWS approved biologist, CDFW shall remove pickleweed and other salt marsh vegetation from the construction zones, including a 15-foot buffer area, to eliminate potential habitat and to aid in visually locating any salt marsh harvest mouse.

Within one month prior to breaching the site, pickleweed and other marsh vegetation shall be removed from the levee breach locations. CDFW will promote passive relocation of salt marsh harvest mouse by opening culverts to slowly flood Ponds 1 and 2 allowing mice to move to upland refugia.

If, despite best efforts to exclude salt marsh harvest mice from the site, salt marsh harvest mice are discovered, construction in its immediate vicinity shall halt until the mouse has been allowed to leave the construction area and USFWS staff is contacted.

4. **California Least Tern.** CDFW shall not conduct any construction activities within 300 feet of an active California least tern nest from April 15th to August 15th of any year (or as determined through surveys). Site inspections, maintenance, research or monitoring activities may be conducted during breeding season in areas in, or near, breeding habitat only with approval of USFWS and under the supervision of a USFWS approved biologist. If these activities are approved, the permittees shall provide evidence of such approval to BCDC prior to conducting such activities.
- E. **Marsh Monitoring Plan.** The Monitoring and Adaptive Management Plan (MAMP), dated December 2016 and prepared by CDFW and Life Science! Inc., shall describe the long-term and short-term biological and physical goals of the marsh restoration, the monitoring of the site to determine whether the success criteria for the project are met, and the provisions for long term maintenance and adaptive management needs, including responsibilities and timelines. The MAMP shall encompass a ten-year monitoring period to track the evolution of the site's biological and physical characteristics. The permittees shall meet with the Commission and other agencies to discuss any potential revisions to the monitoring going forward. The monitoring plan, at a minimum, shall include the following:
- 1. **Site Conditions and Modifications.** The MAMP shall include a topographic map of the site at two-foot contour intervals showing the proposed modifications. All elevations shall be relative NAVD88. The map shall include typical cross-sections

showing the proposed elevations of the sloped transitional habitat berm, access berms, trails, raised levees and road, swales after excavation and fill placement. The map shall show: (1) figures for the ratios of typical horizontal to vertical slopes for proposed marsh surface, particularly for areas where either grading, excavation, or fill will take place; and (2) expected plant species along the cross-sections according to their expected zone of growth.

2. **Reference Site.** The MAMP shall include identification and monitoring of a suitable reference site that shall provide a comparison for evaluating the progress and success of the restoration site.
3. **Sedimentation.** The MAMP shall include a monitoring plan for the accretion and/or erosion on the site, including the locations and methods of measurement. The plan shall include monitoring of the breach locations to determine if maintenance dredging would be necessary and monitoring the site's marsh plain to annually assess accretion or erosion rates over a ten-year period beginning with a pre-construction topographic survey to establish a baseline. An upward trend of the marsh plain elevation would indicate that sedimentation and biomass accumulation is occurring on-site as anticipated.
4. **Water Quality.** The MAMP shall include a plan for water quality monitoring that shall, at a minimum, monitor tide stages, pH, salinity, dissolved oxygen and temperature in the restoration area. As proposed, data shall be collected via the Department of Water Resources, California Data Exchange Center station located on Hill Slough, which would provide information on water levels, salinity, dissolved oxygen and temperature. The pH levels and turbidity of the site water shall be collected as defined in the SWPPP and the methylmercury monitoring shall follow the requirements described in the Water Boards WQC and II-F.2.

Data collection shall begin six months prior to the start of the restoration site construction to establish a baseline and shall continue annually throughout the construction period and post construction for a minimum of 10 years.

5. **Vegetation.** The MAMP shall include monitoring of vegetation establishment on the habitat berms and in the newly restored tidal wetlands every three years over the ten-year monitoring period or until the sites are 85% vegetated with native species. Vegetation monitoring shall include the method for determining the amount of vegetation establishment at the restoration site, and may include the use of aerial photographs, photo-points, vegetative transects, etc., to estimate vegetation cover, including species present; percentage of the site vegetated; approximate percentage representation of different plant species, including special status plant species; and a qualitative assessment of anticipated plant colonization. Monitoring of non-native invasive plant species and their assessment shall also be conducted to inform their management and control on the site.

6. **Invasive Plant Control.** The MAMP shall include an invasive plant control plan for the identification, eradication and monitoring of undesirable plant species over the 10-year monitoring period. The plant control plan shall include providing the results of the eradication efforts necessary to keep levels of invasive plants, such as non-native reed (*Phragmites australis*), perennial pepperweed (*Lepidium latifolium*), or other invasives, at a five percent or less increase over baseline (aerial coverage) of the project site.
 7. **Wildlife Surveys.** The MAMP shall include provisions for monitoring the use of the site by Ridgway's rail, salt marsh harvest mouse, least tern and fish populations for ten years following the completion of restoration activities, as described in the MAMP.
 8. **Monitoring Reports.** By December 31st of each year following the initiation of restoration activities, the permittees shall submit monitoring reports describing the data collected pursuant to the approved restoration plan, analysis of the data collected to assist in determining if the site is proceeding towards the short and long term goals, for review and approval by or on behalf of the Commission.
- F. **Water Quality.** The project shall be conducted in a manner consistent with the Bay Plan Water Quality policies as follows:
1. **Water Quality Certification.** The permittees shall implement activities authorized herein in compliance with the requirements of the San Francisco Bay Regional Water Quality Control Board's (Water Board) Conditional Water Quality Certification (WQC) issued on June 16, 2017 and any future amendments to the WQC, including the post-construction monitoring and reporting as described in the project's *Monitoring and Adaptive Management Plan* (MAMP), to ensure that potential water quality impacts of the project are minimized.
 2. **Methylmercury.** To aid in the understanding of methylmercury production and availability at the site, and to inform future adaptive management strategies that may be proposed to remedy excess methylmercury accumulation at the site, if it occurs, the CDFW shall confirm that the project is not causing or contributing to a net increase in mercury or methylmercury loads in Suisun Bay through:
 - a. development and implementation of a Methylmercury Monitoring Plan for the project that includes sampling frequency, methods and biosentinel monitoring. Monitoring shall be conducted pre and post construction and include at least six monitoring events that occur over a minimum of ten years; or
 - b. a \$30,000 contribution to the Regional Monitoring Program for Water Quality in San Francisco Bay for project supporting a Suisun Marsh methylmercury monitoring program.

The monitoring plan or documentation of the financial contribution shall be provided to Commission staff for review and approval concurrent with submittal to the Water Board and not less than 60 days prior to breaching the site.

CDFW shall make the project site available to appropriate researchers and scientists and encourage methylmercury research at the site beyond that of the requirements herein.

3. **Water Quality Reporting.** By January 31 following each monitoring year, the permittees shall provide to the Commission, water quality monitoring summary reports concurrently with the submission to the Water Board, including the monitoring results based on the data collected by the California Data Exchange Center as described in Section II–E.4.

- G. **Flood Reporting and Adaptive Management Plan for Grizzly Island Road and the Restored Hill Slough Wildlife Area.** The permittees shall ensure that the project meets the requirements of the Suisun Marsh Habitat Plan and other entities that have jurisdiction over the site and surrounding area and are responsible for assuming adequate flood protection for the surrounding communities from flooding originating from the project.

In preparation for projected sea level rise, and more frequent inundations due to fluvial flooding, high tides and/or storm events, CDFW and Solano County shall monitor and document flooding at their respective public access areas, required herein.

If at any time, any portion of the public access, road or bicycle lanes required by this permit is subject to flooding that requires a closure of public access for a period of two weeks or more, the co-permittees shall submit a report documenting the date, location, recorded local tide level, duration and extent of flooding, any damage or cleanup necessary, and include any photographs of the flooding noting the date, time, location, and orientation.

Every five years, for as long as Grizzly Island Road is in use, CDFW (restoration site and public access) and Solano County (Grizzly Island Road) shall assess and summarize the extent and duration of flooding and the overall conditions of Grizzly Island Road and public access trails. This assessment and summary shall include: the stability of the improved section of Grizzly Island Road; scour at the culverts, trails, bridge and protective berms surrounding transmission towers; and any erosion of levees or habitat features. The summary shall also identify any interim adaptation measures that are needed to protect the roadway and public access areas from intermittent flooding. If interim adaptation measures are warranted, CDFW and Solano County shall apply for and obtain an amendment to this permit if additional construction is proposed.

When the Mean High Water level at or near the public access areas required herein reaches 8.4 feet NAVD88 (the elevation at which flooding of public access areas is predicted to occur) the permittees shall notify Commission staff and initiate an adaptation planning process to identify and implement long-term adaptive management measures for the tidal marsh, public access and roadway. Within a year of notifying the Commission of such conditions, the permittees shall provide the Commission with a work plan describing the adaptation approach and the plan shall be reviewed by or on behalf of the Commission.

Any adaptation measures proposed pursuant to the planning process required in this condition shall not result in a reduction of the size or usability of the public access required herein or, if unavoidable, equivalent access shall be provided nearby. The permittees shall obtain any necessary review and approval, or amendment to this permit, if required, to be consistent with the Commission's laws and policies.

- H. **Creosote Treated Wood.** No pilings or other wood structures that have been pressure treated with creosote, or other petroleum based product shall be used in any area subject to tidal action in the Bay and Suisun Marsh within the Commission's jurisdiction as part of the project authorized herein.
- I. **Certification of Contractor Review.** Prior to commencing any grading, demolition, or construction, the general contractor or contractors in charge of that portion of the work shall submit written certification that s/he has reviewed and understands the requirements of the permit and the final BCDC-approved plans, particularly as they pertain to any public access or open space required herein, or environmentally sensitive areas.

III. Findings and Declarations

This authorization is given on the basis of the Commission's findings and declarations that the work authorized herein is consistent with the McAteer-Petris Act, the *San Francisco Bay Plan*, Suisun Marsh Preservation Act, and the *Suisun Marsh Protection Plan* for the following reasons:

- 1. **Fill.** This project is located in the Primary Management Area of Suisun Marsh and proposed activities are entirely within a managed wetland, therefore Section 66605 of the McAteer-Petris Act, and pursuant policies on Bay Fill do not apply. However, both the Bay Plan and the Suisun Marsh Protection Plan have policies regarding fill in managed wetlands, which state that the design and evaluation of “[a]ny project for the restoration, enhancement or conversion of the managed wetlands to subtidal or wetland habitat ... should include an analysis of: ...potential fill activities, including the use of fill material such as sediments dredged from the Bay and rock to assist restoration objectives.”
 - a. **Restoration and Enhancement.** As described by CDFW and Solano County, the project was designed to minimize fill, provide adequate transitional habitat and refugia for upland species and protect existing infrastructure. The CDFW proposes to contour and grade the project site producing 73,850 cy of soils necessary for much of the restoration work. The amount of fill required for the levee improvements were determined by the availability of on site soils, the desired elevation and slopes of the proposed transitional habitat and protective berms, in conjunction with the local tidal range and the 100-year flood elevations. The proposed Grizzly Island Road elevation of 10 feet NAVD88 was designed taking into account the local high tides and the 100-year flood elevation. The width of the proposed road base was designed to allow future raising of the road as needed by Solano County.

The CDFW proposes to use the available on-site soils to create wetland and upland features for the tidal restoration and managed wetland enhancement. The work includes lowering and breaching of levees, and excavating to create a wetland area and swales. The excavated soils would be used to raise the elevation of levees, to create transitional habitat, construct protective berms for transmission towers, public access paths, and where appropriate, improve the Grizzly Island Road.

To ensure that the transitional habitat berms would be structurally sound, geotechnical investigations were conducted during the planning and design phase of the project. The evaluation of the berms' safety and reliability included consideration of shrinkage estimates for the borrowed soils and slope stability and concluded that the on-site soils would be suitable for berms to be constructed over, and adjacent to, existing levee embankments (Crawford & Associates, 2017).

To enhance the managed wetlands in Pond 4 and 4A, the maintenance of the perennial and seasonal wetlands and upland habitat will require installation of five new water control structures, one culvert to be replaced in-kind and four culverts replaced with flap gates in Pond 4's southern levee and the levee between Pond 4 and 4A. The site currently has a variety of existing water control structures, that will be removed (13 culverts) or capped and left in place if not deemed to inhibit restoration and habitat development (one culvert).

To ensure that the project is consistent with the Bay Plan and SMPP policies on fill as it relates to the restoration of managed wetlands, Special Conditions II-A-1, 2, 3 and 4 have been included in this authorization. These special conditions require the CDFW to provide final construction plans to the Commission for review and approval before commencing construction.

- b. **Grizzly Island Road and Public Access.** Over half of the project's on-site soils will be re-used for the construction of the restoration features. The remaining on-site soils shall be used for the new side slopes of Grizzly Island Road, reducing the need for imported fill and limiting it to the materials specific to, and necessary for, road construction.

To complete the Grizzly Island Road improvements, including the bicycle lanes, connections to, and surfacing of, the public trails, the project will import approximately 33,000 cy of fill specifically for road construction. The widening and raising of the road and inclusion of bicycle lanes requires that the road be widened at the base, with side slopes varying from 3:1 to 10:1, to support the improvements as well as allowing for future raising of the road to adapt to sea level rise over time. The imported soils are necessary because on-site soils lack the characteristics necessary to meet road engineering design and standards.

In addition to soil, the road improvement also requires approximately:

- (1) 28,903 square yards of geotextile fabric installed between the existing road and shoulder and the new, Type 1 material (an engineered fill imported from a local Surface Mining and Reclamation Act (SMARA) approved quarry);
- (2) 23,601 cy of imported Type 1 material used for road base;
- (3) 6,154 cy of Class 2 aggregate base material to construct a temporary two-lane bypass road, two bicycle lanes and access road to Pond 4. This aggregate will also be used as trail surfacing material for the levee loop trail and the connecting trail; and
- (4) 3,503 cy of hot mix asphalt and concrete to finish the new Grizzly Island Road, the bicycle lanes.

The Grizzly Island Road improvement also underwent geotechnical review. Soils tests were conducted, embankment settlement rates and slope stability were assessed. Based on the analysis, the proposed embankment slopes for the improved road would be stable and have less chance of soil creep if the road were surcharged and allowed to settle for several months before being paved. According to the engineering report the site does not lie with a fault zone nor are there any known active faults within or through the project area. The potential for fault rupture is considered to be low. Although a liquefaction study for the roadway was not done, a preliminary analysis of the site soils suggested that the soils 19 to 31 feet below the existing road surface are susceptible to liquefaction and consequential settlement (Crawford & Associates, 2016), as is typical for the soils in the entirety of Suisun Marsh.

As described above, the site contains three PG&E transmission towers that require protection once the site is breached. To respond to this need, CDFW proposes to construct protective access berms around the tower footings in Pond 2 and construct a small 20-foot wide maintenance road to allow continued access to two towers, using on site soils. These berms will be built to 8 feet NAVD88 with 6:1 slopes, sufficient to protect the tower and resist erosion from tidal action. An additional lower berm (7 feet NAVD88 with a 10:1 slope) will be constructed adjacent the maintenance access berm to prevent approach by watercraft where low wires traverse the site. This berm will also provide high tide refugia and habitat benefits.

Special Conditions II-C-1, 2, and 5 require the CDFW to re-use the soils excavated during construction as fill necessary in other parts of the project and to import only the material needed for roadway improvements, and to use best management practices for construction operations appropriate for a managed wetland setting.

Because the project will use all of the excavated on-site material for the fill portions of the project, and that the quantity of material required for the roadway stability and surfacing is the minimum amount necessary to construct the project, the Commission finds that the project is consistent with the relevant San Francisco Bay Plan and Suisun Marsh Protection Plan policies regarding fill in managed wetlands.

2. **Public Access and Recreation.**

- a. **Maximum Feasible Public Access.** Section 66602 of the McAteer-Petris Act states, in part, that “...existing public access to the shoreline and waters of the...[Bay] is inadequate and that maximum feasible public access, consistent with a proposed project, should be provided.” In addition, the Bay Plan policies on public access state, in part, that “a proposed fill project should increase public access to the Bay to the maximum extent feasible...” and that “access to and along the waterfront should be provided by walkways, trails, or other appropriate means and connect to the nearest public thoroughfare where convenient parking or public transportation may be available.” The SMPP Recreation and Access policies recognize the high demand for recreational uses of the Suisun Marsh. The SMPP Recreation and Access Policy 3 states that “[p]ublic agencies acquiring land in the Marsh for public access and recreational use should provide a balance of recreational needs by expanding and diversifying opportunities for activities such as bird watching, picnicking, hiking and nature study.” Policy 4 addresses the care of public access areas by stating “[a]gencies administering land acquired for public access and recreational use should be responsible for maintaining the areas and controlling their use. Signing on roads leading into the Marsh and maintaining litter receptacles at major public use areas should be provided by the appropriate local or State agency to prevent littering and vandalism to public and private property.”

Currently, public access near the Hill Slough tidal wetland restoration site consists of the Grizzly Island Trail, a multi-use pedestrian path that follows Highway 12 from Marina Boulevard in Suisun City to McCoy Creek Way and Grizzly Island Road, informal trails formed along the top of existing levees, and the access road between Ponds 4 and 4A. The public access areas around the project site are used for bird watching, hiking, and cycling. However, the most popular activity is angling along Hill Slough, with up to 10,000 anglers fishing in Hill Slough annually. Parking is currently available near the crossing of Grizzly Island Road and McCoy Creek Way and also near the Grizzly Island Bridge. Visitors to the site also park on the non-designated, undeveloped shoulder along Grizzly Island Road to access different areas of the site.

CDFW owns and manages the Hill Slough Wildlife Area, a publicly owned site, and will increase the public access opportunities at the site by providing the following improvements as part of the restoration project:

- (1) Two designated, 4-foot-wide, Class II bicycle lanes along the improved section of Grizzly Island Road;

- (2) An all-season, 1.76 mile loop trail around Pond 4, atop the existing levee and access road;
- (3) A 0.31 mile long trail parallel to Grizzly Island Road, connecting the loop trail to Grizzly Island Trail via an at-grade crossing of Grizzly Island Road (Exhibits D, E);
- (4) New signage for cyclists, new interpretive signs and seating for hikers along the loop trail; and
- (5) Use of the site by non-motorized watercraft once levees have been breached and the boats are able to enter via Suisun Slough and Hill Slough.

The applicants expect an increase in recreational use of the site due to these improvements and acknowledge that the higher number of new visitors may potentially impact sensitive wildlife species in the project area. To minimize impacts to wildlife, the new trails were placed in areas that are mostly elevated, away sensitive habitat areas, and surrounded by water. Interpretive signs explaining the importance of staying on the trails and protecting wildlife will be installed along the trails. Special Condition II-B-1 and 2 require the public access amenities to be constructed.

These public access improvements will be constructed at the same time as the work on Grizzly Island Road and the tidal restoration work within the managed wetlands and are expected to be completed by 2019. Once the project is finished, Solano County will be responsible for the upkeep and management of the two bicycle lanes running along Grizzly Island Road, including enforcing parking limits along the new lanes. CDFW will maintain and manage the new public access trails, seating and signage within their property.

Once construction of Grizzly Island Road and the bicycle lanes are complete, Solano County will take over their maintenance. Because staff has concerns regarding the safety of a Class II bike lane on this long stretch of road where speeding is prevalent, Special Condition II-B-3 was included. This condition requires Solano County to study bicycle and automobile safety and parking along this stretch, and if after one year, safety issues are identified, provide the Commission with proposed measures to improve it for review and approval. To ensure that the public access remains available and safe during the restoration and construction, Special Conditions II-B-4 has been included in this authorization.

- b. **Recreation Opportunities.** The SMPP Recreation and Access policies recognize the need for easy to access recreational areas within the Suisun Marsh. Recreation and Access Policy 2 states "...[t]hese areas should be located on the outer portions of the Marsh near populations centers and easily accessible from existing roads." In addition, it states that "[i]mprovements for public use should be consistent with protection of wildlife resources." The public access proposed by the applicants is located along the northern edge of the Suisun Marsh near Highway 12, where Grizzly Island Road intersects with a residential neighborhood in Suisun City. Suisun City is

adjacent to Suisun Slough and the project site's western border, and the City's boat launches are within paddling distance of the site. Grizzly Island Trail, a regional multi-purpose trail, also leads from Suisun City to the northwestern corner of Pond 4A, where the new proposed public trail will connect to it at Grizzly Island Road. The new public access trails will be available for outdoor recreation year-around, specifically for walking, running, and wildlife viewing. Cycling will be possible along the Grizzly Island Road bicycle lanes which could potentially be extended in the future through partnership between Solano County and the Solano Transportation Authority. The Hill Slough Wildlife Area will also be accessible to small water craft during high tides. These amenities expand and diversify the recreational opportunities in the Hill Slough Wildlife Area. Existing, designated parking areas are available at both ends of the one-mile stretch of Grizzly Island Road that runs through the project site. The continued maintenance by CDFW and Solano County of the public access trails and bicycle lanes, respectively, including trash clean up, encourages use and enjoyment of the Hill Slough Wildlife Area.

- c. **Appearance, Design, and Scenic Views.** Bay Plan Policies state that “[m]aximum effort should be made to provide, enhance or preserve views of the Bay and shoreline, especially from public areas.” and that “[...]views of the Bay from vista points and from roads should be maintained by appropriate arrangements ... particular attention should be given areas along roads that that provide good views of the Bay.” Implementation of the project will not adversely impact present or future public access and views to the Bay, as both Hill Slough Wildlife Area and Grizzly Island Road are open to the public. The restoration work will open portions of the Hill Slough Wildlife Area to tidal flows and encourage the development of a variety of wetland and upland habitats. The project provides a diversity of public access opportunities and views throughout the Hill Slough Wildlife Area; riding a bike on the bike lanes will grant a different perspective of the site than walking on the trails, and the new seating at the midpoint of the loop trail would offer views of the Potrero Hills, Mount Diablo, the California Coast Range, and Montezuma Hills. The restoration activities and re-establishment of tidal marsh habitat on site will draw visitors to the site and could expand awareness of restoration efforts throughout the Suisun Marsh, and the ecological values of wildlife habitats in the area. Increasing the height of Grizzly Island Road may impede some views across the site to the west for users of the adjacent public access trails, however, it will increase the views for people traveling in automobiles and bicycles. The views to the east from the trails will likely be improved as a result of the trails being raised in elevation.

Special Condition II-B-2, 3 and 5 were included in this authorization to ensure the construction and continued maintenance of the public access within the site and on Grizzly Island Road.

The Commission finds that the project is consistent with the Bay Plan and the Suisun Marsh Protection Plan policies regarding maximum feasible public access consistent with the project, recreational opportunities, and appearance, design and scenic views.

3. **Natural Resources Policies.** The Bay Plan and SMPP have several policies related to natural resources.

- a. **Tidal Marsh Restoration.** The SMPP Environment Policy 1 states, “[t]he diversity of habitats in the Suisun Marsh and surrounding upland areas should be preserved and enhanced whenever possible to maintain the unique wildlife resource.” Environment Policy 2 states, “[t]he Marsh waterways, managed wetlands, tidal marshes, seasonal marshes, and low-land grasslands are critical habitats for marsh-related wildlife and are essential to the integrity of the Suisun Marsh. Therefore, these habitats deserve special protection.”

The Bay Plan Tidal Marsh and Tidal Flat Policy 4 states that, “[w]here feasible, former tidal marshes and tidal flats that have been diked from the Bay should be restored to tidal action in order to replace lost historic wetlands or should be managed to provide important Bay habitat functions, such as resting, foraging and breeding habitat for fish, other aquatic organisms and wildlife.”

The Bay Plan’s Fish, Other Aquatic Organisms and Wildlife Policy 1 states that “[t]o assure benefits of fish, other aquatic organisms and wildlife for future generations, to the greatest extent feasible, the Bay’s tidal marshes, tidal flats, and subtidal habitat should be conserved, restored and increased. Policy 2 states “[s]pecific habitat that are needed to conserve, increase or prevent the extinction of any native species, species threatened or endangered, ...should be protected.”

The Bay Plan Managed Wetlands Policy 2 states in part that, “[i]f the owner of any managed wetland withdraws any of the wetlands from their present use, the public should make every effort to... restore them to tidal or subtidal habitat... for the benefit of multiple species.”

Bay Plan Tidal Marsh and Tidal Flats Policy 6, Managed Wetland Policy 3, as well as the SMPP Land Use and Marsh Management Policy 14, all contain similar language that, in summary, states that projects that restore, enhance or convert managed wetlands to wetland habitat should include clear and specific long-term and short-term biological and physical goals, success criteria, a monitoring program to assess the sustainability of the project, and provisions for long-term maintenance and management needs.”

Prior to European settlement of the Sacramento-San Joaquin Delta, Suisun Marsh was a vast, brackish water marsh, providing nationally significant wildlife habitat. Over time, managed wetlands were established in the Marsh, diking off the large areas of marsh from tidal action, and creating a tangled network of water control structures that allowed owners to cultivate vegetation specifically to attract

waterfowl for hunting purposes. In recent years, EcoRestore and the Suisun Marsh Habitat Plan developed plans to restore a significant portion of Suisun Marsh to tidal marsh habitat.

Because Suisun Marsh is a brackish marsh, rather than the marine-dominated salt marsh habitat in the Bay proper, it has the potential to support native and listed species of plants and animals that have limited habitat in other areas of the Bay and Delta. Restoring this portion of Hill Slough Wildlife Area will increase brackish marsh habitat in the region and thereby enhance, restore and protect this limited habitat and the species that inhabit it. The site will have transitional features that will provide high tide refugia for species in the near-term and may allow brackish marsh habitats space to migrate as sea level rises.

The Hill Slough Wildlife Area is owned by CDFW and the eastern half of this 1,700-acre property is already tidal wetlands. By restoring the remaining 640 acres of managed wetlands to tidal wetlands, the project shall effectively almost double the size of the Hill Slough Wildlife Area tidal marshes. The project is expected to increase the habitat diversity of the site by including upland and transitional habitat which would benefit both protected fish and wildlife species, especially those reliant on brackish tidal marsh. This project will fulfill a portion of the Suisun Marsh Habitat Plan's overall goal to restore 5,000-7,000 acres of Suisun Marsh to tidal marsh in order to support listed species and further sustain critical habitats.

The applicants stated that the implementation of the project will result in a change in habitat types from 850 acres of managed wetland habitat to 640 acres of tidal marsh habitat and the enhancement of 192 acres of retained managed seasonal wetlands not converted to tidal marsh by the project. The tidal habitat would include 53 acres of seasonal/transitional wetlands; 19 acres of high marsh; 18 acres of mid-marsh; 110 acres of low marsh; and 440 acres of open water.

To allow for adequate tidal flow, portions of the existing interior and exterior levees shall be breached, excavating gaps in the existing levees. The breach locations were chosen to achieve a balance between three primary objectives: (1) to take advantage of the pre-existing drainage network; (2) to emphasize the re-creation of higher order tidal channels within the marsh restoration area; and (3) to provide drainage for the entire site (USFWS, June 2017). The breaching of the levees and restored tidal flow to the site are expected to result in large increases of tidal prism in local channels. The ebb and flood volumes near the confluence of Suisun Slough and Hill Slough are projected to increase by 67%, and the Hill Slough the ebb and flood volumes to increase by approximately 88%. The applicants expect vegetation typical of Suisun Marsh brackish tidal wetland to passively colonize the site. The existing transitional habitat shall be expanded, creating more diverse habitat for terrestrial species such as the salt marsh harvest mouse, Ridgway's rail and a variety of marsh birds. By breaching the site, the project is expected to increase habitat for green sturgeon and Delta smelt as both of these species use the tidally influenced

areas of Suisun Bay, Grizzly Bay and the Suisun Marsh. The portions of the site not influenced by tides will remain a mixed wetland complex, managed by CDFW. To protect existing marsh vegetation in the project site, Special Condition II-C-3 requires the permittees to survey, salvage and replant special status native marsh vegetation in the construction zones and minimize impacts on vegetation outside these zones.

- b. **Monitoring and Management.** The Bay Plan and SMPP require restoration projects to include success criteria, monitoring, long- and short-term biological and physical goals and a long-term maintenance and management program.

CDFW provided a Monitoring and Adaptive Management Plan (MAMP), which details the physical and biological objectives of the project and includes a monitoring program, performance metrics, management measures, and provisions for longer-term maintenance and management needs such as water quality and non-native species control. The monitoring program includes the methods, criteria, metrics and frequency of monitoring the physical conditions, hydrology, water quality, fish, wildlife, vegetation, and infrastructure of the site. The results of such surveys will be used to manage, maintain and protect the restored habitat, species and improved and adjacent infrastructure of the site. CDFW will implement the MAMP upon project construction by monitoring compliance to agency requirements (water quality, road stability), the project's ability to meet performance objectives (tidal hydrology, Ridgway's rail and salt marsh harvest mouse use of site), and includes potential supplemental studies that will provide information on the effects of enhancement action impacts on the ecosystem (special-status plant distribution, channel geometry). The supplemental studies will be conducted based upon the availability of additional funding and/or research partnering. CDFW will monitor and report their findings annually for five years once the site is breached. Specific project elements as described in the MAMP shall be monitored annually for total of ten years, including water quality, infrastructure and vegetation. Given the mutable nature of restoration projects the MAMP was designed and written to allow revisions as warranted.

The applicants' MAMP includes details on location of instrumentation, the frequency of measurement, and types of anticipated data that shall be collected and analyzed to assess water quality within Hill Slough. Data shall be collected by the Department of Water Resources, California Data Exchange Center (CDEC) station located on Hill Slough, which will provide pre-project information to establish a water quality baseline. Data collection through the CDEC will continue during project construction and for an additional five years post construction. Having access to continuously collected data on the tide stages, conductivity, temperature, dissolved oxygen and turbidity shall inform CDFW of water quality performance in Hill Slough as well as water levels necessary to trigger adaptation planning. If it was determined that the project is causing impairments to water quality, the level and intensity of monitoring

be revised for the project site, focusing on the specific water quality constituents of concern and methods to resolve the water quality issues. The project's water monitoring activity is required in this authorization by Special Condition II-E-4.

The Tidal Marsh and Flats Policy 7 and the SMPP Land Use and Marsh Management Policy 3, require project proponents to control invasive species in restoration projects. The MAMP describes the data collection methods to document the location and spread of non-native species and provides measures for the control of invasive species and adaptive management of the site over time. In summary, these measures include monitoring vegetation changes at the project site for development of typical Suisun Marsh wetland vegetation community and minimizing colonization by invasive species. The monitoring will be conducted tri-annually using aerial photography and ground-truthing to verify vegetation coverage and composition identified in the photos. Colonization by non-native, invasive plant species will be controlled by weeding, herbicides, or burning, and may require more intensive monitoring. Special Conditions II-E-5 and 6 require the permittees to monitor the restored site for native and non-native plant species, and to take steps to reduce invasive non-native species to a maximum of five percent coverage within the site.

SMPP Land Use and Marsh Management Policy 3, states that "[p]ractices recommended by the Solano County Mosquito Abatement District to control mosquitoes, including ditching and draining...efforts toward biological control of mosquitoes should be intensified." The existing managed wetlands on Hill Slough Wildlife Area contains areas of stagnant water that facilitate the presence of mosquitoes. The project site lies within Solano County Mosquito Abatement District, which conducts regular monitoring and control of nuisance adult mosquitoes throughout the Marsh. The "cool weather" mosquito (*Culiseta inornata*) is known to exist at the project site, is expensive to control, and is a public health concern. To mitigate this issue, the project proponents propose to lower and remove existing levees that separate the site into 8 ponds where breeding occurs, which is expected to greatly reduce mosquito breeding habitat.

- c. **Fish and Wildlife.** Bay Plan Policy 2 regarding Fish, Other Aquatic Organisms and Wildlife, discussed above, also state that listed or candidate species ... under the California Endangered Species Act, or any species that provides substantial public benefits, should be protected, whether in the Bay or behind dikes. Further, Policy 4 (a) in summary directs the Commission to consult with the resource agencies whenever a proposed project may adversely affect an endangered or threatened plant or wildlife species. Policy 4 (b) also states that the Commission should not authorize projects that would result in the "taking" of any listed species unless the project applicant has obtained the appropriate "take" authorization. Finally, Policy 4 (c) directs the Commission to give appropriate consideration to the recommendations of the resources agencies to avoid possible adverse effects of a proposed project wildlife and its habitat.

Suisun Marsh is home to a number of listed species, and activities within the Marsh, including restoration, levee maintenance, or dredging have the potential to impact these species. To protect the habitat the Suisun Marsh provides for special status species, the regulatory and resource agencies worked together over the past several years to establish avoidance, minimization and mitigation measures for activities that regularly occur within the Suisun Marsh. As a result of this planning, the agencies developed the Suisun Marsh Habitat Plan, which describes permissible activities and corresponding minimization and mitigation measures. Responding to this planning effort, in 2013 NMFS and USFWS issued programmatic biological opinions for the Suisun Marsh Habitat Plan. These biological opinions provide incidental take authorizations and terms and conditions for activities listed in the Suisun Marsh Habitat Plan. Restoration of tidal marsh is programmatically covered in the biological opinions; however, they require a project level evaluation of each restoration project.

The applicants have designed this project to be consistent with tidal marsh restoration criteria described in the Suisun Marsh Habitat Plan and to reduce impacts to listed species through implementation of avoidance and minimization measures during construction, such as establishing unvegetated buffer areas, using exclusion fencing to prevent the salt marsh harvest mouse from entering construction areas, and conducting surveys for the Ridgway's rail.

The overall Hill Slough Wildlife Area project design is consistent with the Suisun Marsh Habitat Plan, and the various biological opinions' terms and conditions. The proposed project objectives are focused on species persistence, recovery, and providing rearing, breeding and refuge habitats for aquatic and wetland dependent species that utilize brackish tidal marsh habitat. Additionally, the project aims to provide topographic variability for habitat succession and resilience against future climate change and sea level rise. While the project will have temporary impacts to the site and available habitats, its overall design and diversity of habitat features is likely to provide improved habitat for listed and other native species as the site develops and matures.

In response to CDFW's request for a project specific biological opinion, NMFS determined that the project as defined would not adversely affect Essential Fish Habitat (EFH), and that the project may affect, but is not likely to likely to adversely affect, listed salmonids, green sturgeon or their designated critical habitat for associated with implementation of the project (NMFS February 2013 Letter of Concurrence).

In response to CDFW's biological assessment of the Hill Slough Wildlife Area project, USFWS appended the project to the programmatic biological opinion for the Suisun Marsh Habitat Plan, and completed a project level-biological opinion on June 23, 2017. The project-level biological opinion addressed modifications to Grizzly Island Road, the new public access trails, the protective berms and access road for the

PG&E towers, mosquito source reduction measures, and the MAMP. USFWS added more specific requirements regarding notification of any entrapment, injury or death of California Ridgeway's rail, salt marsh harvest mouse, California least tern and Delta smelt; conservation measures and education requirements for project personnel; and monitoring and reporting requirements. Based on the inclusion of conservation measures to minimize adverse effects to listed species and their habitats, the short timeframe for the restoration project construction activities, and the resulting increase in restored wetlands and associated upland habitat associated with the project, the USFWS determined that the project as proposed was not likely to jeopardize the existence of Ridgeway's rail, salt marsh harvest mouse, California least tern and Delta smelt, and provided an incidental take statement for the above species.

The proposed project objectives are species focused and include providing rearing, breeding and refuge habitats for aquatic and wetland dependent species that utilize brackish tidal marsh habitat, and providing topographic variability for habitat succession and resilience against future climate change and sea level rise. The project as conditioned by USFWS and NMFS is protective of listed species. Further, it will provide significant habitat improvements for native species that inhabit brackish marshes. Special Conditions II-D-1, 2, 3, 4 detail the activities required to protect the site's listed species during and after construction.

- d. **Water Surface Area and Quality.** The Bay Plan Surface Area and Volume Policy 1 states "the surface area of the Bay and the total volume of water should be kept as large as possible in order to maximize active oxygen interchange, vigorous circulation, and effective tidal action..."

The Bay Plan Water Quality Policy 1 states, in part that "Bay water pollution should be prevented to the greatest extent feasible. The Bay's tidal marshes, tidal flats, and water surface area and volume should be conserved and, whenever possible, restored and increased to protect and improve water quality."

Policy 2 states that "[w]ater quality in all parts of the Bay should be maintained at a level that will support and promote the beneficial uses of the Bay as identified in the San Francisco Bay Regional Water Quality Control Board's Basin Plan and should be protected from all harmful or potentially harmful pollutants. The policies, recommendations, decisions, advice, and authority of the State Water Resources Control Board and the Regional Board should be the basis for carrying out the Commission's water quality responsibilities."

The restoration site is currently disconnected from daily tidal influence, and reconnecting it to the Bay will increase the Bay's surface area by 640 acres, and increase tidal exchange of waters, oxygen, and nutrients. As a managed wetland, the water levels on site have been previously managed within a system of eight ponds separated by levees with a variety of water control structures. Restoring tidal action to six of the eight ponds through breaching and lowering of internal and external

levees would improve circulation within the site, preventing the pooling of water. By removing or plugging numerous culverts within the site, the tidal waters will be directed towards the breached areas, naturally creating tidal channels.

The two ponds that will remain managed wetlands will be better managed due to the replacement of old culverts and flap gates to allow improved water exchange. Seasonal ponding within the two ponds will also be improved with the creation of new swales and a “pothole” to collect and drain the waters. The project’s MAMP proposes to monitor the physical evolution of the site once it is re-opened to daily tidal action, and to assess if the tidal hydrology, channel geomorphology and networks are developing as planned.

The primary water quality concern for this project is methylmercury contamination and bio-magnification in the food web. There is a large amount of mercury biologically available in the San Francisco estuary ecosystem due to abandoned, historic mercury mines in the Coast Range, use of mercury for gold extraction in the Sierra Nevada, and atmospheric deposition across the Bay Area. Restoring sites to tidal action may increase the potential for mercury to methylate, making it potentially bio-available to animals living in the Suisun Marsh. Methylmercury dynamics in estuaries are complex and can be cyclical in nature, and little is known about the status of methylmercury in the Suisun Marsh.

CDFW indicates that the project would result in an overall reduction in methylmercury concentrations on the site by improving tidal exchange and reducing prolonged periods of inundation within the existing managed wetlands areas. However, as mercury methylation is cyclical, it is the staff’s understanding that increased wetting and drying of a site, such as with tidal action, may increase methylmercury production, which is counter to the applicant’s perspective. The San Francisco Bay Regional Water Quality Control Board (Water Board) states that “[t]idal wetlands can be both sources and sinks of total mercury and methylmercury, and many factors can affect wetland biogeochemistry and thus methylmercury production. The limited data and studies suggest that tidal restoration results in many factors that could reduce methylmercury production but that overall methylmercury supply can potentially increase because of greater hydrologic exchange. Based on the design, the project is not expected to cause or contribute to a net increase in mercury or methylmercury loads to Suisun Bay.” To address this issue, Special Condition II-F-2 and the Water Board’s water quality certification requires the project proponents to confirm that the project is not causing or contributing to a net increase in mercury or methylmercury loads to Suisun Bay by either: (1) contributing to the Regional Monitoring Program for Water Quality in the San Francisco Bay to fund project(s) to support regional methylmercury monitoring in Suisun; or (2) develop and implement a Methylmercury Monitoring Plan for the project site.

Related to potential turbidity impacts, CDFW stated that because the site currently consists of non-tidal uplands, managed wetlands, levees and embankments, and that the soils are consolidated, the increase of suspended sediment and turbidity are expected to be minimal. CDFW proposes, and Special Condition II-C-4 requires, that the exterior levees be breached during a low tide to prevent excavated soils from entering the adjacent tidal sloughs. Once tidal action is fully restored, the suspended sediment from the sloughs and unconsolidated soils on the site will be reworked by the tides, with suspended sediments depositing over time. Initial impacts of sediment and soil movement are expected to be temporary in nature and will reduce over time.

As required by the Water Board and described in the provided Erosion and Sediment Control Plan, construction impacts from the raising and widening of Grizzly Island Road and the PG&E tower access berms will be addressed. This plan, along with the Stormwater Pollution and Prevention Plan, includes Best Management Practices, ensuring no sediments or pollution will be released from the site into Suisun Slough, Hill Slough or other tidal areas. To further reduce the potential for discharges of pollutants, the project will also comply with minimization/mitigation measures outlined in Special Conditions II-C-2, 5 and the Suisun Marsh Habitat Plan's EIS/EIR. These measures include daily inspections of all equipment for oil and fuel leaks, trash and construction debris removal, maintenance of waste facilities, preparation and implementation of erosion and sediment control plan, and developing a hazardous material plan.

The Commission finds that by implementing the minimization measures and various pollution prevention plans, adhering to the best management practices detailed in the Special Conditions, and having obtained a Water Quality Certification and Waste Discharge Requirements, the project is consistent with its Bay Plan policies regarding water quality.

4. **Climate Change and Flooding.** The Commission's Climate Change policies include discussions of habitat restoration projects as well as protection from and adaptation to climate change, and specifically rising seas. Bay Plan Climate Change Policy 2 states that "When planning shoreline areas ... a risk assessment should be prepared by a qualified engineer and should be based on the estimated 100- year flood elevation that takes into account the best estimates of future sea level rise and current flood protection and planned flood protection that will be funded and constructed when needed to provide protection for the proposed project or shoreline area. A range of sea level rise projections for mid-century and end of century based on the best scientific data available should be used in the risk assessment. Inundation maps used for the risk assessment should be prepared under the direction of a qualified engineer. The risk assessment should identify all types of potential flooding, degrees of uncertainty, consequences of defense failure, and risks to existing habitat from proposed flood protection devices."

Bay Plan Climate Change Policy 3 adds that “To protect public safety and ecosystem services, within areas that a risk assessment determines are vulnerable to future shoreline flooding that threatens public safety...should be designed to be resilient to a mid-century sea level rise projection. If it is likely the project will remain in place longer than mid-century, an adaptive management plan should be developed to address the long-term impacts that will arise based on a risk assessment using the best available science-based projection for sea level rise at the end of the century.”

Bay Plan Climate Change Policy 4 states that “To address the regional adverse impacts of climate change, undeveloped areas that are both vulnerable to future flooding and currently sustain significant habitats or species, or possess conditions that make the areas especially suitable for ecosystem enhancement, should be given special consideration for preservation and habitat enhancement and should be encouraged to be used for those purposes.”

Bay Plan Climate Change Policy 7 states that “Until a regional sea level rise adaptation strategy can be completed, the Commission should evaluate each project proposed in vulnerable areas on a case-by-case basis to determine the project’s public benefits, resilience to flooding, and capacity to adapt to climate change impacts.” Further, it states that projects that have regional benefits, advance regional goals such as natural resource restoration, should be encouraged if their regional benefits and their advancement of regional goals outweigh the risk from flooding.

The Bay Plan Safety of Fills Policy 4 requires that “[m]easures should be provided to prevent damage from sea level rise and storm activity that may occur on fill or near the shoreline over the expected life of a project.”

Bay Plan and SMPP Managed Wetland policies state that the design and evaluation of “[a]ny project for the restoration, enhancement or conversion of the managed wetlands to subtidal or wetland habitat ... should include an analysis of: ...flood management measures.”

The applicants used the National Resource Council (NRC, 2012) sea level rise projections for the San Francisco Bay, and previous modeling of tidal marsh resilience to sea level rise throughout the San Francisco estuary (Schile et al. 2014) to conclude that tidal areas of the Suisun Marsh would have a high likelihood of adapting and persisting in the future. This analysis included a review of suspended sediment concentrations in the region to determine if the project could adapt to sea level rise through natural accretion of sediment. In reviewing modeling conducted by Schile et al. 2014, CDFW determined that northwestern Suisun Marsh has a high suspended-sediment concentration and that the brackish marsh vegetation community accretes and builds organic soils, both of these characteristics promote sediment accumulation and marsh accretion. The lowered levees, acting as mid-marsh islands would slow wind waves inside the newly formed wetlands. Breach locations were designed to enhance tidal circulation and sediment transport into the site and internal levees would be left in place to further promote sedimentation, maximizing accretion rates.

The project was designed to maximize its resilience to sea level rise. Because the site is proposed for restoration to tidal marsh habitat, flooding associated with storm events would part of the natural ecological functioning of the site. The two ponds to remain as managed wetlands would have water control structures that will allow maintaining water levels appropriate for the target habitat and wildlife species in that portion of the project site.

The project includes bolstering Pond 1's west levee with a sloped habitat berm designed to protect the residences along the west shore of Whispering Bay in Suisun City from coastal erosion due to waves generated in the Hill Slough restoration area. Raising and widening of Pond 4's levee to 9.3 feet NAVD88 and maintaining Ponds 4 and 4A as non-tidal, managed wetland and upland habitat provides a wide area that will limit impacts to residences to the north of the project site. This remaining managed wetland area buffers the area to the north from the open tidal water that will occur south of Pond 4. Tidal action and waves from breaching levees along the western portion of the site will be dampened by the expanse of restored marsh and the shallow slope on the side of Grizzly Island Road, which is designed to block any waves less than 10 feet NAVD88 from traveling from the west side of the site to the east. Additionally, the location of the Hill Slough Wildlife Area along the northern edge of the Suisun Marsh has space for marsh migration along its northern project boundary. Information regarding the restored site and improved Grizzly Island Road's resilience to flooding will be collected and reported per Special Condition II.G and II. H-1, and will provide CDFW and Solano County with information necessary to plan for adaptive measures.

Specific activities were included in the project to protect existing infrastructure from sea level rise and designed based on sea level rise projections for 2050. These activities include the raising of Grizzly Island Road to the FEMA 100-year flood elevation, protecting the PG&E tower footings with access and protective berms, raising the Pond 4 levees to 100-year high-tide elevations. In addition to these project elements, the proposed widened base of Grizzly Island Road would provide future space to raise the road another foot to 11 NAVD88 as future conditions require.

The Commission staff worked with CDFW and Solano County to better understand the risk to the project and area from rising sea. CDFW states that the project is resilient to mid-century sea level and greatly improves the site when compared to current conditions. However, as noted by staff, the Suisun Marsh is very low in elevation, and is vulnerable to impacts from rising seas, particularly after mid-century. CDFW has not yet developed an adaptive management plan to address the potential impacts of climate change or other flooding issues over the extended life of the project. CDFW states that as sea level rise progresses, they will need to continue to assess the site conditions and those of the surrounding area to determine what adaptive management measures would be effective. Special Condition II-G requires sea level monitoring to inform the development of an adaptive management plan for the site. The permittees will commence an adaptive planning process when Mean High Water reaches an elevation of 8.4 NAVD88, leaving time to prepare for significant flooding of the public access

areas. The adaptation planning process will identify and implement long-term adaptive management measures for the tidal marsh, public access and roadway. The Pond 4 levee trail will be constructed at an elevation of 9.36 NAVD88 and the roadway, including the bike lanes will be constructed at an elevation of 10 NAVD88.

The Commission finds that as conditioned, specifically by Special Condition II-G, the proposed project is consistent with the McAteer-Petris sections and relevant San Francisco Bay Plan policies regarding safety of fill, flooding, and climate change.

- F. **Environmental Review.** The Suisun Marsh Habitat, Management, Preservation and Restoration Plan EIR was certified by CDFW in December 2011. The Suisun Marsh Habitat, Management, Preservation and Restoration Plan EIS Record of Decision was signed by the Bureau of Reclamation and the United States Fish and Wildlife Service in April 2014. The Hill Slough project is part of the programmatic analysis of the overall Plan, but was not evaluated at the project level.

The Drought Executive Order of April 25, 2014 by Governor Brown (January 17, 2014 Proclamation) directed CDFW to implement projects responding to drought conditions through habitat restoration on CDFW-owned or managed property for the benefit of fish and wildlife impacted by the drought. The executive order temporarily waived CEQA requirements.

- G. **Conclusion.** For all the above reasons, the Commission finds, declares, and certifies that, subject to the Special Conditions stated herein, the project authorized herein is consistent with the McAteer-Petris Act, the *San Francisco Bay Plan*, the Commission's Regulations, the Suisun Marsh Preservation Act, and the *Suisun Marsh Protection Plan*.

IV. Standard Conditions

- A. **Permit Execution.** This permit shall not take effect unless the permittees executes the original of this permit and return it to the Commission within ten days from the date of the issuance. No work shall be done until the acknowledgment is duly executed and returned to the Commission.
- B. **Notice of Completion.** The attached Notice of Completion and Declaration of Compliance form shall be returned to the Commission within 30 days following completion of the work.
- C. **Permit Assignment.** The rights, duties, and obligations contained in this permit are assignable. When the permittees transfer any interest in any property either on which the activity is authorized to occur or which is necessary to achieve full compliance of one or more conditions to this permit, the permittees/transferor and the transferee shall execute and submit to the Commission a permit assignment form acceptable to the Executive Director. An assignment shall not be effective until the assignee executes and the Executive Director receives an acknowledgment that the assignee has read and understands the permit and agrees to be bound by the terms and conditions of the permit, and the assignee is accepted by the Executive Director as being reasonably capable of complying with the terms and conditions of the permit.

- D. **Permit Runs with the Land.** Unless otherwise provided in this permit, the terms and conditions of this permit shall bind all future owners and future possessors of any legal interest in the land and shall run with the land.
- E. **Other Government Approvals.** All required permissions from governmental bodies must be obtained before the commencement of work; these bodies include, but are not limited to, the U. S. Army Corps of Engineers, the State Lands Commission, the Regional Water Quality Control Board, and the city or county in which the work is to be performed, whenever any of these may be required. This permit does not relieve the permittees of any obligations imposed by State or Federal law, either statutory or otherwise.
- F. **Built Project must be Consistent with Application.** Work must be performed in the precise manner and at the precise locations indicated in your application, as such may have been modified by the terms of the permit and any plans approved in writing by or on behalf of the Commission.
- G. **Life of Authorization.** Unless otherwise provided in this permit, all the terms and conditions of this permit shall remain effective for so long as the permit remains in effect or for so long as any use or construction authorized by this permit exists, whichever is longer.
- H. **Commission Jurisdiction.** Any area subject to the jurisdiction of the San Francisco Bay Conservation and Development Commission under either the McAteer-Petris Act or the Suisun Marsh Preservation Act at the time the permit is granted or thereafter shall remain subject to that jurisdiction notwithstanding the placement of any fill or the implementation of any substantial change in use authorized by this permit. Any area not subject to the jurisdiction of the San Francisco Bay Conservation and Development Commission that becomes, as a result of any work or project authorized in this permit, subject to tidal action shall become subject to the Commission's "bay" jurisdiction.
- I. **Changes to the Commission's Jurisdiction as a Result of Natural Processes.** This permit reflects the location of the shoreline of San Francisco Bay when the permit was issued. Over time, erosion, avulsion, accretion, subsidence, relative sea level change, and other factors may change the location of the shoreline, which may, in turn, change the extent of the Commission's regulatory jurisdiction. Therefore, the issuance of this permit does not guarantee that the Commission's jurisdiction will not change in the future.
- J. **Violation of Permit May Lead to Permit Revocation.** Except as otherwise noted, violation of any of the terms of this permit shall be grounds for revocation. The Commission may revoke any permit for such violation after a public hearing held on reasonable notice to the permittees or its assignee if the permit has been effectively assigned. If the permit is revoked, the Commission may determine, if it deems appropriate, that all or part of any fill or structure placed pursuant to this permit shall be removed by the permittees or its assignee if the permit has been assigned.

- K. **Should Permit Conditions Be Found to be Illegal or Unenforceable.** Unless the Commission directs otherwise, this permit shall become null and void if any term, standard condition, or special condition of this permit shall be found illegal or unenforceable through the application of statute, administrative ruling, or court determination. If this permit becomes null and void, any fill or structures placed in reliance on this permit shall be subject to removal by the permittees or its assignee if the permit has been assigned to the extent that the Commission determines that such removal is appropriate. Any uses authorized shall be terminated to the extent that the Commission determines that such uses should be terminated.
- L. **Permission to Conduct Site Visit.** The permittees shall grant permission to any member of the Commission's staff to conduct a site visit at the subject property during and after construction to verify that the project is being and has been constructed in compliance with the authorization and conditions contained herein. Site visits may occur during business hours without prior notice and after business hours with 24-hour notice.